Claims

1. Use of a silanized hydroxyethylcellulose (HEC) or silanized hydroxypropylmethylcellulose (HPMC) hydrogel, which self-crosslinks as a function of pH, for three-dimensional *ex vivo* culture of chondrocytes.

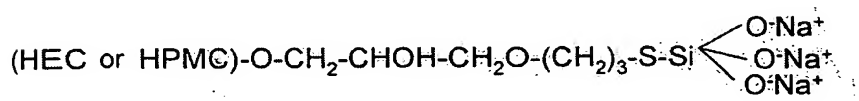
2. The use as claimed in claim 1, wherein the hydrogel may be obtained by the reaction of HEC of HPMC with a compound of formula (1):

$$X\ Si(OZ)_3 \qquad (1)$$

wherein X represents a halogen atom or a hydrocarbon group having an epoxy function, in particular $C_{2\text{-}20}$, and Z is selected from among a hydrogen atom, an alkali metal and an alkyl group, in particular $C_{1\text{-}5}$.

3. The use as claimed in either claim 1 or claim 2, wherein the HEC or the HPMC carries silanolate side groups or alkali metal or ammonium silanolate precursors representing from 0.5 to 5 % of the total dry weight of the HEC or the HPMC.

4. The use as claimed in any one of claims 1 to 3, wherein the hydrogen consists of a polymer of the simplified formula:



5. An *ex vivo* process for the preparation of a complex of cells integrated in a hydrogel, the complex being intended to be injected into a cartilaginous site, wherein said process includes the *ex vivo* mixing of chondrocytes with a silanized hydroxyethylcellulose (HEC) or silanized hydroxypropylmethylcellulose (HPMC) hydrogel, crosslinking as a function of pH, in a biological buffer at an appropriate pH for the crosslinking of the hydrogel, under

appropriate conditions and for an appropriate period for the integration and the three-dimensional culture of the chondrocytes in the hydrogel.

6. An *ex vivo* process for the preparation of a complex of cells integrated in a hydrogel, the complex being intended to be injected into a cartilaginous site, wherein said process includes the *ex vivo* mixing of undifferentiated cells capable of chondrogenic differentiation with a silanized hydroxyethylcellulose (HEC) or silanized hydroxypropylmethylcellulose (HPMC) hydrogel, self-crosslinking as a function of pH, in a biological buffer having an appropriate pH for the crosslinking of the hydrogel, under appropriate conditions and for an appropriate period for the integration and the three-dimensional culture of the chondrocytes derived from the differentiation of said undifferentiated cells, in the hydrogel.

7. The process as claimed in claim 5, including the following *ex vivo* steps:

- monolayer amplification of chondrocytes on a solid support;

- harvesting of the amplified chondrocytes, dedifferentiated through the monolayer amplification thereof;

- mixing of the dedifferentiated amplified chondrocytes with the hydrogel in a biological buffer at an appropriate pH for the crosslinking of the hydrogel, resulting in the integration of the chondrocytes within the hydrogel and in the redifferentiation thereof.

8. The process as claimed in any one of claims 5 to 7, wherein the hydrogel may be obtained by the reaction of HEC or HPMC with a compound of formula (1):

$$X\,Si(OZ)_3 \qquad (1)$$

wherein X represents a halogen atom or a hydrocarbon group having an epoxy function, in particular $C_{2\text{-}20}$, and Z is selected from among a hydrogen atom, an alkali metal and an alkyl group, in particular $C_{1\text{-}5}$.

9. The process as claimed in any one of claims 5 to 8, wherein the HEC or the HPMC carries silanolate side groups or alkali metal or ammonium silanolate precursors representing from 0.5 to 5 % of the total dry weight of the HEC or the HPMC.

10. The process as claimed in any one of claims 5 to 9, wherein the hydrogel consists of a polymer of the simplified formula: